7.0 Site Operations and Maintenance

7.1 Pond Operations

Twelve constructed ponds collect and manage surface water runoff at the Site. The ponds are grouped together in series based on the drainage in which they are located, with the A-Series Ponds in North Walnut Creek, the B-Series Ponds in South Walnut Creek, the C-Series Ponds in Woman Creek, and the Landfill Pond in No Name Gulch. Ponds A-4, B-5, and C-2 are referred to as "terminal ponds," because they are the farthest downstream ponds in their respective drainages, and the ponds from which water is discharged off the Site. Off-site discharges of water from the terminal ponds are currently performed using a batch release method. The location of the ponds and drainage features are given in Figure 2–1.

During CY 2006, the Site performed no terminal pond discharges. Pond A-3 was discharged to Pond A-4 twice in CY 2006 (Table 7−1). For habitat enhancement, water was periodically allowed to enter Pond B-1 from S. Walnut Creek, and Ponds A-1 and A-2 from North Walnut Creek. As of December 31, 2006, Ponds A-3, A-4, B-5, C-2, and the Landfill Pond were holding a total of approximately 12.1 million gallons (12.2 percent of total capacity).

Table 7−1. CY 2006 Pond Water Transfers

Transfer	Dates	Volume (million gallons)
Pond A-3 to A-4 (outlet works)	1/9−1/13/06	2.04
Pond A-3 to A-4 (outlet works)	3/31−4/3/06	1.26

Monthly routine dam inspections, pond level measurements, and piezometer measurements were performed as scheduled during the year. Semiannual movement monument surveys and inclinometer readings were also performed as scheduled; nothing unusual was noted. Annual dam mowing was completed in July and August. The annual Federal Energy Regulatory Commission dam inspection was completed in August. Upgrades to automated instrumentation and staff gages were completed for all ponds during the year.

7.2 Passive Ground Water Treatment Systems

Routine maintenance by LM personnel was begun in late October 2005. Prior to that, these activities were performed by K-H. The system-specific summaries below focus on tasks performed by LM. Details regarding monitoring, maintenance, and operation of the MSPTS, ETPTS, and SPPTS are presented in Section 3.3.2.

7.3 Landfills

The general approach for the PLF and OLF monitoring and inspections, along with the results of those inspections, is shown below.

7.3.1 Present Landfill

The PLF consists of approximately 22 acres of an engineered RCRA Subtitle C-compliant cover over a former sanitary/construction debris landfill. The cover was completed in May 2005. A diversion channel surrounds the landfill and diverts storm water runoff away from the landfill to No Name Gulch. The landfill has a passive seep interception and treatment system, installed to treat landfill seep water and GWIS water, that discharges into the Landfill Pond. A gas extraction system is also built into the landfill and allows subsurface gas to vent to the atmosphere. The landfill final construction site conditions will be used as a baseline for comparisons made during site inspections.

The inspections of the PLF in CY 2006 were initially conducted quarterly. Monthly inspections were initiated in June consistent with the requirements contained in the most recent Monitoring and Maintenance plan released in May 2006 (DOE 2006b). It is anticipated that after the first year, the inspection frequency may be reduced to quarterly for an additional 4 years. The inspection program will be evaluated at the next CERCLA review scheduled for 2007. The findings and observations of the inspections are presented in the Quarterly and Annual Reports, which will be submitted to EPA and CDPHE. Inspections and monitoring tasks are addressed in Appendix A of the *Final IM/IRA for IHSS 114 and RCRA Closure of the RFETS Present Landfill* (DOE 2004), and include ground water and surface water monitoring (see Section 2.8.1 and Section 3.4.1), monitoring subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, and erosion in surrounding features so that corrective actions can be taken in a timely manner.

7.3.1.1 Inspection Results

Eight inspections were performed at the PLF in CY 2006. The inspection process followed the format and protocol established in the *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan, Rocky Flats Environmental Technology Site* (DOE 2006b). No significant problems were observed during these inspections. Refer to the inspection forms accompanying this document (Appendix C) for additional information.

Monitoring of surface water and ground water is covered in those respective sections of this report.

7.3.1.2 Settlement Monuments

In late July the settlement monument locations proposed in the PLF Monitoring and Maintenance Plan were field surveyed to correspond to the exact locations used in the waste settlement calculations. Installation of the settlement monuments at the PLF began August 7. Progress was slow because the soil was very rocky and highly compacted. The work was stopped while the installation method was re-visited. After consultation with DOE-LM, DOE Office of Environmental Management, the landfill design engineer, and the settlement monument design engineer, an agreement was reached to use a backhoe to perform the first stage of excavation for the remaining eight monuments on the top of the landfill. Once the bio-barrier was reached the excavation was completed manually. The six monuments on the east face of the landfill required manual excavation due to the steep slope.

Installation of the settlement monuments at the PLF was completed the fourth week of August. Revegetation of the excavation areas was completed by RF LM personnel. The initial quarterly surveying of the settlement monuments was performed in December.

7.3.2 Original Landfill

The OLF consists of approximately 20 acres of an engineered cover over a former solid sanitary and construction debris landfill. The cover was completed in August 2005. The final cover consists of a 2-foot-thick Rocky Flats Alluvium soil cover that was constructed over both a regraded surface and a buttress fill. The original surface was regraded to provide a consistent slope. A 20-foot-high, 1,000-foot-long soil mass buttress fill was placed at the toe of the landfill. Erosion is controlled by a series of diversion berms that carry storm runoff away from the cover in lined channels. In addition, the soil cover was covered with both straw mulch and a spray-on erosion control medium called "Flexterra." A perimeter channel collects runoff from the diversion berms and carries it away from the landfill.

The inspections of the OLF in CY 2006 were initially conducted quarterly. Monthly inspections were initiated in June consistent with the requirements contained in the most recent Monitoring and Maintenance plan released in February 2006 (DOE 2006a). It is anticipated that after the first year, the inspection frequency may be reduced to quarterly for an additional 4 years. The inspection program will be evaluated at the next CERCLA review scheduled for 2007. The findings and observations of the site inspections are presented in the Quarterly and Annual Reports, which will be submitted to EPA and CDPHE. Inspections and monitoring tasks are addressed in Appendix B of the Final IM/IRA for the OLF (DOE 2005a), and include ground water and surface water monitoring (see Section 2.8.2 and Section 3.4.2), monitoring subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, and erosion in surrounding features so that corrective actions can be taken in a timely manner.

7.3.2.1 Inspection Results

Eight inspections were performed at the OLF in CY 2006. The inspection process followed the format and protocol established in the *Final Landfill Monitoring and Maintenance Plan, Rocky Flats Environmental Technology Site, Original Landfill* (DOE 2006a). No significant problems were observed during these inspections. Refer to the inspection forms accompanying this document for additional information.

7.3.2.2 Seeps

Seep #7

An area of saturated soil was observed in the area above Seep #7 in December 2005. K-H personnel were contacted to investigate the problem. K-H asked LM personnel to hand dig several "potholes" in one area of subsidence near the lower end of the seep collection system. Two potholes were made, one to a depth of about 4.5 feet and the other to a depth of about 2.5 feet. Neither pothole exposed the drain collection system.

A more extensive investigation of the OLF Seep #7 "burrito drain" was conducted May 23. Three perpendicular trenches were dug with a backhoe at the lower, middle, and upper sections of the drain. No obvious problems were seen with the function of the drain at these locations. Water was observed moving through the rock interior of the drain as designed. No sediment build-up or tearing of the geo-textile fabric was observed in the three locations inspected. The shallow depression above the lower footprint of the drain was believed to be caused by settling of the soil due to insufficient compaction during construction. Following the inspection, the area was leveled with a backhoe and compacted with a vibrator attachment on the end of the backhoe boom. The contractor returned to the landfill on May 24 to re-seed the impacted area, install erosion matting, and repair minor ruts left in the west drainage ditch by the backhoe during ingress and egress to Seep #7.

Seep #4

In July a shallow trench was dug approximately half the length of Diversion Berm #3 to drain areas of standing water at Seep #4 to the west perimeter ditch. All the current wet soil areas associated with suspected seeps on the OLF were surveyed using the field GPS instrument to provide a snapshot of the status of the seep areas on the landfill cover. The GPS information will be used to track seep/wet area locations over time. Photographs were taken of each location as well.

Seeps #4 and #7 at the OLF were evaluated again September 7. Both seeps still showed areas of active ground water seepage that is being drained by Diversion Berm #3. A French Drain system was designed that could be used (when or if required) to assist drainage of these wet areas off the landfill to the west perimeter ditch.

7.4 General Site M&O

The Site will be managed and maintained to protect the remediation activities that have taken place in the closure of the Site. Assessment of the Site will be performed on both a scheduled and continuous basis. Highlights of the routine and nonroutine maintenance and operation is shown below.

7.4.1 Plainview Fire Fighting Support

Rocky Flats LM supported efforts to fight the January 11 Plainview fire located just west of the Rocky Flats Site by allowing firefighters to fill their pumper trucks from the Rocky Flats Raw Water pond. The fire burned more than 2,700 acres of grassland, but never crossed Highway 93 to threaten the Site. Firefighters were very appreciative of the support from Rocky Flats and for allowing them access to a water source in such close proximity to the fire.

7.4.2 Rocky Flats Fire

A grass fire April 2 burned approximately 850 acres on the northeast corner of the POU/COU. The source of the fire was an arc from a faulty contact and broken conductor on an electrical power pole. Fire crews responded within eight minutes and called multiple agencies for mutual aid due to the wind driven, rapid spread of fire and the proximity to other jurisdictions. Eight emergency response agencies, including Broomfield, Westminster, and Boulder, responded.

Extensive local media coverage focused on the threat to nearby homes and generally left the Rocky Flats Site out of the spotlight.

Firefighters entered the Site and surrounding areas and lit numerous backfires to control the spread of the fire. The Westminster Emergency Response agencies also implemented a precautionary evacuation of the Walnut Creek subdivision in case the fire continued to spread toward Westminster. The fire was contained within approximately three hours and completely extinguished by 8:00 p.m. that evening.

The fire was limited to former POU/COU lands and never reached any erosion controls or recently re-vegetated areas, with the exception of one temporary road that was being re-vegetated. One surface water monitoring station (GS08 located below Pond B-5), was destroyed by the fire. The station was replaced before any water was discharged from Pond B-5. Several other water-monitoring stations suffered minimal damage that did not affect operability. No damage was found to any ground water monitoring wells. Fences damaged by firefighters cutting locks and fencing to access the Site and fallen power poles were repaired. Signage on the perimeter fence along Indiana Avenue and Highway 128 was replaced where needed.

Several permanent photo-monitoring locations were established in and around the wildfire location to document the ecological effects of the fire. Initial photos were taken shortly following the fire, and will be retaken throughout the growing season.

7.4.3 Rocky Flats Site Road Upgrades

Several dirt roads in the area of the COU were in poor repair, and during times of high precipitation were nearly impassible. To maintain access to all sections of the Site for surveillance and maintenance work, the worst of the problem areas on these roads were improved. Depending on the specific problem being addressed, the improvements included road base, geotextile fabric, rock water crossings, and surfactant.

The road improvements started August 7. Although the work started out well, several areas were identified that required preliminary work to support the road upgrades. Specific problem areas included a sinkhole likely related to a former sanitary sewer manhole, an area in the COU with chronically-wet soil, and an abandoned culvert. Culverts were installed across FC-4 to support a new east-west road traversing the COU. Surfactant was applied September 8. The subcontractor rolled and compacted the roads one final time on September 11 prior to de-mobilizing the equipment.

The subcontractor returned the week of September 25 to perform a second phase of upgrades to several additional roads at the Site. Road base was used to upgrade access roads in the former IA and to construct work pads around the ETPTS and the MSPTS. This second phase of work was completed October 3 when the surfactant was applied.

7.4.4 Erosion Control

The existing erosion controls are maintained and repaired to protect the bare soil areas until the vegetation can stabilize the soil. Assessing the erosion control is especially important following high wind events which are common at the Site. Reestablishment of the vegetation in the

disturbed areas was assessed during the growing season. Areas lacking sufficient vegetative cover were reseeded to assure adequate establishment of the native vegetation in these areas.

Maintenance of the Site erosion control required effort throughout CY 2006, but especially during the windy months of January and February. Erosion control matting required replacement of the stakes and/or wire spikes originally used to secure the matting. In areas of very rocky soil, a common characteristic of Rocky Flats alluvium, staking was ineffective and large rocks and cobles were used to secure the matting. During the 2nd quarter of CY 2006 a subcontractor was hired to assist with erosion control efforts in some larger areas near the B-series ponds. The work was initiated the first week of May, with reseeding performed prior to the installation of the erosion matting.

Erosion wattles were also loosened and displaced by the wind, and required restaking. In areas where the soil allowed, the original stakes were replaced with longer stakes to allow deeper penetration of the stake in the soil to better hold the wattle.

Several high-precipitation rain events occurred during the summer, which initiated investigations of the Site to assess potential erosion or other damage. In late June a heavy rainfall event occurred that required erosion control repairs in early July on the hillside east of FC-5 where previous rainfall events had eroded soil along the wattles. Wattles on the hillside were repositioned so they were placed along a contour line rather than running almost parallel with the direction of water flow (as originally installed). Old wattle materials were placed in the eroded cuts to stop any further soil erosion and facilitate these areas filling with sediment. The eroded cuts along the edge of the riprap area of FC-5 were filled with riprap to minimize further downcutting. Additional erosion control repairs were made in FC-1 where wattles had been placed previously.

Approximately 2 inches of rain fell at the site July 7 (based on National Renewable Energy Laboratory data). Erosion control surveys were conducted July 10 to evaluate any problems. Observations were also made of the areas repaired the week of July 3. No problems were observed.

Throughout the fall and winter months the field crew replaced erosion controls in several areas, including sensitive areas where the new roads were constructed. Wattles that had been destroyed or blown out of place were repaired/replaced on the OLF and on the hillside south of FC-4 (east of the SW056 slump). Water bars were dug to divert any heavy runoff into FC-5. Erosion control matting was added to several areas that appeared to be potentially prone to erosion based on summer storm events. Overseeding and erosion matting replacement was completed at the PLF, the OLF, the former Building 371 area, the hillside east of FC-5, and south of the FC-4 area.

7.4.5 Aerial Survey

A contract to perform aerial photography and a topographic survey of the Rocky Flats Site and former BZ was awarded during the second quarter of CY 2006. The survey was needed to support vegetation studies with high-resolution aerial photographs as well as provide updated topographical maps of the DOE retained lands. Additional aerial photographs of the Site were requested for public relations use. Establishment of ground control coordinates, specified to facilitate integration of previous aerial surveys with the new survey, was performed the week of

June 19. A clear day was required for good quality aerial photography and mapping, and was completed June 27. The completed photographs and topographic maps were due from the subcontractor August 31, but were delayed due to problems converting the vertical datum from NAVD88 to NGVD27 to allow existing Rocky Flats date to be integrated with the new orthophotos and topographic maps.

7.4.6 Site Access Control

The security of the Site is assessed on a continuous basis. The perimeter fence is maintained and replaced as required. Excess or unnecessary gates in the perimeter fence were removed and replaced with fence to reduce the number of access points to the Site.

In January and February general upgrades were made to the east perimeter fence. Posts were installed and wire replaced and/or repaired as necessary to make the fence intact. Although the fence is nearing the end of its useable life, it is still functional for maintaining a barrier to Site access from Indiana Street.

In March an SUV slid off Indiana Street and rolled over the east perimeter fence. Emergency response crews cut through the fence just south of the accident to allow access for rescue operations. Both areas of damage to the perimeter fence were repaired as the tow truck was removing the vehicle.

In March the fence just south of the west gate was damaged by a vehicle that apparently could not make a complete stop before contacting the fence. Repairs were minor, and required a new "T" post and re-stretching of the lower two strands of barbed wire.

In addition to routine maintenance in CY 2006, fence repairs performed by the Rocky Flats staff included a new gate that was built and secured on the sawmill road, repairs to the adjacent fence near this gate, and repairs to the gate near the McCaslin-Hwy 128 intersection.

A subcontractor was employed in early May to do a thorough repair of the east perimeter fence along Indiana Street. The repairs involved replacement of broken and/or missing fence posts, replacement and re-tensioning of the barbed wire in sections of fence found to be in poor condition, reattachment of the wire to the posts, and installation of additional fence stays.

On the night of May 5 a vehicle hit the west gate. One of the wooden gate posts and a short section of wire fence was damaged. The gate chain and locks were moved to the former K-H gate located approximately 300 feet east to maintain security of the Site. The fencing subcontractor employed to repair the east perimeter fence repaired the gate post and re-hung the gate. New signs that read "Dead End" and "Road Closed" were placed at the west gate to help inform individuals that they are on the west access road to the Site, and not on a continuous roadway. Additional barricades were also added to the fence line on either side of the west gate.

In August a statement of work was issued for a subcontract to support Site fencing needs. The statement of work included scope for assistance in making minor adjustments to the COU fence location, construction of the COU fence, and for future fence repairs (as needed) after the initial fence construction is complete. The minor adjustments to the fence location were performed in early October. The construction of the COU fence was started November 6. The fence

construction work progressed well through November and December until the first of several heavy snow storms hit the Site on December 20, causing the construction to be halted until snow cleared enough to resume work in 2007.

7.4.7 Site Surveillance

A contract for Site surveillance was awarded in CY 2006, with surveillance initiated April 19. The surveillance is performed during times when the field sampling crew is not normally in the field. These times include coverage evenings during the week, and continuous coverage Thursday evening through Monday morning.

During CY 2006 the subcontract surveillance personnel reported the use of illegal fireworks north of the Site, ands were the first to discover and report the vehicle damage to the west gate. They also made numerous contacts with drivers of vehicles stopped near the Site, and were visible by passing motorists while stationed at their observation stations, possibly preventing unauthorized access through the heightened public awareness of their presence.